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## Space Activities: Implications for Education

by Jack C. Oppenheimer

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National Aeronautics and Space Administration*

*The following article was adapted, and brought up to date, from an address delivered before the Educational Press Association of America, Washington, D.C., April 20, 61.*

**I**T TOOK THE IMPACT of a Sputnik to dramatize the need for some long overdue actions as well as thoughts about U.S. educational philosophy and practice in a revolutionary age which would not let us adjust to the myth of a changeless American and world society. The American people have awakened to the need for the training of more and better physical scientists and engineers. The cultural pattern in the United States has favored the success image of the businessman, with the result that this role has been most attractive to our youth over the years. But the new threats and pressures of the continued Cold War competition, as well as our admitted errors in assessing the capabilities of the Russians and other nations, have confronted our system of values and education with an emergency.

### International Competition

Understanding the implications for our educational philosophy and curriculum of a kind of "Olympic games" series of events in which each nation or society tries to do and publicize its best in all areas of human affairs, will help us to think through to the right decisions and to take the right actions.

Which social system can best conserve and develop human and natural resources; produce goods and services; encourage and practice the arts and music; furnish technical, economic, and nutritional aid to underdeveloped nations; plan and rehabilitate cities; clean up slums; make some sense out of urban sprawl; build schools; train teachers; perform medical research; construct public transportation facilities? This kind of international competition requires the development and application of larger national resources and a different allocation of these resources. It might leave less of

None so rich and none so poor

• "... paternalism has no place in relations among sovereign nations. There is only one relationship that is sound—and that is one of partnership. All nations must in their own self-interest accept proportionate responsibility for the achievement of a rapidly expanding world economy. The first responsibility of each country is to speed its own development. Its second responsibility is to assist other nations in accordance with its means. No nation is so rich that it cannot profit from an expanding world economy and no nation is so poor that it cannot help other nations."

*Excerpt from an address, "The Greatest Challenge of All," given by Paul G. Hoffman at the 25th Anniversary Conference of the Public Affairs Committee, Inc., March 24, 1961.*



the gross national product available for the important and dramatic research and development in space and other new physical sciences and technologies. Under these conditions of life, the search for basic and new knowledge and understanding in the natural and behavioral sciences and the formulation of new educational ideas and practices are conditioned by the immediate and future needs of national domestic and foreign policy. This, then, is the "New Frontier" for American education!

The disputes about "social or life adjustment" versus increased academic courses of instruction may in truth be *academic*. What is required in fact is a supreme effort to teach in our schools and disseminate through our mass media of communications competence, and even excellence, of knowledge in the natural and physical sciences, mathematics, languages, literature, humanities, and—last but not least—the social and behavioral sciences, in order to survive and to win this international competition.

This is the challenge for our free, open, pluralistic way of life, which includes the egalitarian tradition of academic public schooling for all who seek it, regardless of intellectual capacity. The gauntlet has been thrown down by the authoritarian Communist societies which, while rigidly thought- and action-controlled, are capable of great dynamism in such dramatic areas as nuclear energy and space. The National Defense Education Act of 1958 and other governmental educational grant or scholarship programs have reflected understandably the nation's preoccupation with its national defense requirements and the related inadequacies in the physical sciences, mathematics, technology and foreign languages. But, what of our other national needs in the social sciences, the arts, humanities, classics, and English literature in order to recognize, analyze and deal with the ideological and psychological challenges to our democracy?

It is significant, I think; that this generation of children is playing games, assuming roles, and formulating attitudes in preparation for adulthood on the basis of space experiences which actually have not yet happened. This is an innovation, since children usually have directed their play and imagination to past or current experiences: Cowboys and Indians, past wars, crimes and adventures of all kinds, and historical events in general. Perhaps this phenomenon will be instructive to parents, teachers, vocational advisers and personnel administrators in government and industry in realistically guarding against either *over* or *under* enthusiasm for the importance of the impact of space activities upon this generation of children's careers and human affairs in general.

A variety of new careers open up as a result of the international competition in the new sciences and technologies, especially the developments in astronautics and space activities. Many scientific and engineering skills are needed for our nation's space program. There will be needed physicists and chemists; electrical, structural, and mechanical engineers; mathematicians and statisticians; geologists and astronomers; biologists and "agratomists" (specialists created by the demands of the space-atomic age for determining radiation dosages which can be tolerated by living organisms); and many other scientific and professional people who combine various disciplines to deal

with the new problems of the space environment. Thus, new skills will be needed to meet the needs of new sciences and technologies; new concepts, knowledge and vocabularies will have to be studied, understood and taught by new teachers, texts, and visual aids.

## NASA Program and Activities

A sketch of NASA's objectives and program may be helpful in indicating the categories of scientific and professional skills and talents which are needed for our nation's space program and which, in turn, could provide meaningful, creative, and productive careers for today's students.

The National Aeronautics and Space Administration is a little over 21½ years old. The language of the 1958 Act creating the agency stated "... that it is the policy of the United States that activities in space should be devoted to peaceful purposes for the benefit of all mankind." NASA is the successor agency to the National Advisory Committee for Aeronautics, a highly respected 43-year-old aeronautical research agency which had also participated in space research. NASA has a total of about 18,500 scientists, engineers and other professional and administrative employees under its direct administration as the aggregate of the 8,000 former NACA personnel; the 150 or so people of the original Naval Research Laboratory's Vanguard project group; the approximately 2,500 people of the Jet Propulsion Laboratory of the California Institute of Technology; and the more than 5,000 former personnel of the Development Operations Division of the Army Ballistic Missile Agency at Huntsville, Alabama.

This fiscal year we have a program measured in terms of money of a little under \$1 billion; next fiscal year it is proposed that the financial resource requirements of the NASA program will be about \$1¾ billion. Of these dollars more than 75 percent are expended under contracts with industry, universities and other nongovernmental organizations.

For convenient reference, NASA's program can be placed in categories as follows:

**Unmanned scientific exploration.** The purposes of unmanned—instrumented—scientific exploration are: to investigate the earth's atmosphere, ionosphere and energetic particles, fields and belts around the earth; to explore our solar system, the galaxies and the universe; and to gain much additional knowledge of our planet from the vantage point of space.

Included in the category of unmanned scientific exploration are plans for Orbiting Geophysical Observatories or satellites for carrying out approximately 50 different geophysical experiments on any one mission, characterized by a standardized stock model structure, power supply, attitude control, telemetry, and guidance and command systems. These Observatories will be about 6' x 3' square; have two 6' square solar paddles to collect the sun's energy to power the satellite's instruments; and will weigh about 1,000 pounds, including 150 pounds of scientific experiments.

Also included in the unmanned scientific exploration program are well advanced plans for lunar exploration,

with spacecraft known as Ranger, designed to carry an instrument package rugged enough to survive a crash landing on the moon. Following the Ranger exploration of the moon are plans for the Surveyor spacecraft which will be able to make a so-called "soft" landing on the moon with more delicate scientific instruments for the collection and measurement of a greater amount of detailed information about the moon.

Unmanned spacecraft also are planned for flights close to Venus and Mars and perhaps later more distant planets. The spacecraft, called Mariner, will carry instruments to measure these other planets' atmospheres, surface temperatures, rotation rates, magnetic fields, and surrounding radiation regions. It should be emphasized that these lunar and planetary explorations, while primarily for scientific purposes, also represent the first steps in technological developments that will lead to manned flights throughout our solar system.

**Manned space flight.** Manned exploration of space in NASA's program is represented by the Mercury project which has as its objective the orbiting of an astronaut around the earth in a manner similar to the Russians' recent successful orbiting of a "cosmonaut" around the earth. Orbiting of a *manned* Mercury space capsule will not be undertaken until further suborbital scientific and safety flight tests have been made (similar to the recent 115-mile altitude trip on May 5th in which the movements and certain operations of the capsule in space were actually controlled by the U.S. astronaut) and also until earth orbits and recoveries of *unmanned* Mercury space capsules have been accomplished.

Subsequent to the orbiting of the manned spacecraft Mercury around the earth, there are planned manned spacecraft, known as Apollo, which will carry crews of two or more astronauts, weigh 15,000 to 20,000 pounds, provide some freedom to move about in the capsule, and assure sufficient flight duration and maneuverability for missions varying from earth orbiting to moon orbiting and landing and return.

**Utilization of space technology.** Two of the most promising applications of earth satellites appear to be in the fields of communications and weather forecasting. Today the capacities of international teleradio and cable systems are burdened by present needs and will be exceeded by tomorrow's demands. Such programs as NASA's project Echo—the "passive" or noninstrumented balloon satellite—have demonstrated that satellites can be used to reflect teleradio and TV signals. NASA's planned project Relay will involve the launching of "active repeater" satellites into space, which, with their electronic instruments, will relay messages from the earth to other active repeater communication satellites and back down to the earth at the desired terminal point.

NASA's meteorological satellite program involves projects known as Tiros satellites I and II which have observed and transmitted more than 44,000 television pictures of the earth's cloud patterns and taken measurements of the heat of the earth and its atmosphere. These meteorological satellites are the first steps in aiding us to understand better the atmospheric processes which produce our weather and climatic changes. At present our meteorological ob-

servations from the earth and sounding rockets projected into high atmospheric altitudes can provide us only with about a 20 to 30 percent coverage of weather phenomena, mostly from the underside of the atmosphere and space surrounding the earth, rather than from the vantage point of outer space itself.

**Launch vehicle programs.** NASA also performs research and development on propulsion systems for obtaining greater thrust and power with which to launch the previously discussed space satellites and spacecraft into space. The programs involve space vehicles known as Saturn, Centaur, Scout, and Atlas-Agena, using a variety of types of engines and rocket stages and various forms of propulsion such as liquid, solid and nuclear fueled rockets.

### Implications of National Space Program for Education

The excellence of our space program depends upon the quantity and quality of the students educated by our schools. This does not mean that our schools should produce only "space scientists" and "space engineers." The program of space exploration and associated technology is, and should continue to be, an integral part of a balanced national effort in all fields of human knowledge. Our form of free society can prevail only to the extent that it integrates successfully the new physical sciences and technologies into its political economy and its social, educational, and national security system.

All students should acquire the understanding, appreciation and knowledge which will prepare them to cope adequately with the rapid changes of this technological age. The nonscience oriented students do not need the highly specialized knowledge required by professional scientists. They should, however, be familiar enough with science, mathematics and engineering to comprehend the increasingly technological environment in which we live, and to acquire the basis to become trained or retrained, if necessary, in the appropriate skills required to manufacture, operate, or maintain the products of this technology. The liberal arts faculties have a great responsibility to aid the undergraduates to achieve basic understanding of scientific principles, methods, terminology, and the place of science and technology in modern life.

Just as the nonscientist student should have a basic understanding and appreciation of science and technology as they affect society, so should the science or engineering major be afforded the opportunity and be required to develop an appreciation for the social sciences, arts and humanities. The world in which we live requires that our educational system produce men and women equipped with the modern languages and mathematics which are the means of communication and understanding in a multinational culture amidst a scientific and technological revolution.

Again, it has been pointed out recently by such scholars as Lewis Mumford that the neglected appreciation and teaching of such social sciences as history and cultural anthropology have deprived us of tools with which to predict, plan, and manage new scientific inventions and

new technological developments. We need military history to help meet current defense requirements. Highly trained technicians who participate in "disarmament" or "arms control" studies and conferences and in inspection and control systems must possess knowledge and appreciation of the political and socio-economic factors as well as of the scientific and technological phenomena involved.

### Research and Education

The processes of scientific inquiry and education can best be carried on by associating research activities and classroom teaching wherever possible. Of course, this creates problems. Some great teachers of graduate students are equally eminent research people; other notable scientists have as little as possible to do with teaching. High-grade industrial, university and governmental laboratories are separated necessarily to some degree from teaching as such. Thus, much scientific and other research is carried on without much connection to graduate education. Universities which receive grants or contracts from government and industry often assign research projects to eminent and capable scientists who occupy themselves fully in attempting to achieve the desired technical objectives, leaving little or no time for teaching. Often universities either arrange faculty teaching assignments without reference to making time available for individual or group research activities or allow favored professors to take no teaching responsibilities whatever as a technique of attracting and keeping people of particularly outstanding reputation. Yet, it must be said that in the long run it is dangerous to separate research in any field of knowledge entirely from education. Obviously, the objective should be the attainment of a truly educational environment of inquiry, learning and teaching.

NASA and the many research and development organizations working in the space field require extremely high standards of scientific talent and engineering know-how. The nation's educational institutions are depended upon for personnel to man space programs and to conduct advanced research and development. Currently NASA has contracts or grants totaling in excess of \$8 million with over 60 different universities for advanced research and development activities. We are anxious to support space-related research efforts by universities. In addition, NASA depends upon qualified scientists and engineers in our colleges and universities for professional consultation and advice. Also, the participation of university faculty members in our programs as consultants and as directors of research projects provides for the updating of instructional material in a timely and efficient manner. The continuous rewriting of text material and classroom presentations is extremely important in fields of knowledge which are undergoing rapid change such as space science and technology. Participation of university faculties in new scientific and technological fields such as space is desirable for the stimulation and education of students who will take leading positions in scientific research and development in the next decade and the next generation.

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## *—The People of NPA—*



**Harry B. Caldwell**

*Keen's Studio*

Seven miles north of Greensboro, in Guilford County, N.C., Harry B. Caldwell, a member of the NPA Agricultural Committee since 1943, raises tobacco, corn, wheat, barley, and Hereford cattle on his 120-acre farm.

Born and raised in Ohio, Mr. Caldwell moved early in life to North Carolina and ever since has played a prominent role in the affairs of his adopted state. Active in North Carolina State Grange since 1929, State Grange Master since 1937, Mr. Caldwell is a member of the Executive Committee of the National Grange. He was the Grange Delegate to International Food and Agricultural Program Conference in Rome, Italy, in 1953, and again in 1957 when the IFAP Conference was held at Purdue.

Former member of the Board of Governors of the Tobacco Association of the United States, Mr. Caldwell is also a member of North Carolina Tobacco Advisory Council, Tobacco Associates, Inc., and the National Tobacco Research Council. He serves as Secretary of Farmers Cooperative Council of North Carolina, Inc., and is a member of the Board of Directors of Farmers Cooperative Exchange.

Time and again in the course of his career Mr. Caldwell was called upon to serve on various North Carolina state boards and commissions. He was the Executive Director of Farm Labor Commission in 1943, and served on the Planning Board and the Advisory Budget Commission.

Ever concerned with education and health problems, Mr. Caldwell served as Executive Secretary of North Carolina Good Health Association and was on the Board of Trustees of Agricultural and Technical College for Negroes, Meredith College, and Mars Hill College.

On the national scene, Mr. Caldwell's advice was sought by more than one administration. President Hoover appointed him to the Rural Housing Commission; President Eisenhower named him to the 14-man Interim Agricultural Advisory Committee. He served on Agricultural Research Policy Committee from 1958 to 1961, when President Kennedy appointed him chairman of the Agricultural Advisory Committee.



## Family Needs and the Social Services in Great Britain

**T**WENTY YEARS HAVE PASSED since the conception of the present system of social services in Great Britain. At the close of World War II, and in the years immediately following the war, an effort was made to coordinate, codify, and extend the social services in Great Britain, and to provide extensive health, housing, education, and insurance benefits.

In a recent study, *Family Needs and the Social Services*, an independent, nonparty British organization, PEP (Political and Economic Planning) surveys the accomplishments and the shortcomings of the program from the point of view of those for whom it has been conceived. Without going into technicalities or administrative details, the PEP report is concerned solely with the consumers' use of and reactions to the social services as currently operating in Great Britain. Three main questions are posed by the report: What use has been made of services? How do people feel about the services in the light of their experience and use? What, in the light of people's current worries, appear to be the main areas of need which are not yet adequately met by the program?

The PEP study concentrates deliberately on the position of ordinary, representative families with children under the age of 16 (roughly 40 percent of all households). The main study was made in the Greater London area but—on the basis of a similar study made in Northampton—the results are believed to be representative for families in other large towns as well. Interviews with nearly 1,000 families provide the basis for the study.

PEP reports that it is "beyond question that the proportion of British families suffering physical hardship and social distress has enormously shrunk since 1939." A satisfactory scheme of social insurance necessarily assumes a high level of employment. "We have been farsighted, or fortunate, enough to avoid serious unemployment," says PEP. The maintenance of employment in Great Britain has been "by far the greatest single factor contributing" to the progress made.

As they are constituted at the moment, the social services in Great Britain are most important to families with several children and to the lower income groups.

Use of services presents a varied picture. Few families in the PEP sample used either very many or very few services. Of the sample families 86 percent had used between 8-14 of the 22 different services.

The *health service*, "open to everyone irrespective of means, age and occupation," was used by 99 percent of the families interviewed. From the point of view of these families, the health service is not only the most widely used, but also the most appreciated, since of all the family problems, illness remains the chief source of worry.

In terms of current public expenditures, the health services are the most expensive of all social services in Great Britain (excluding retirement pensions). Despite admittedly "very incomplete" evidence, PEP reports that

the total current net cost of the National Health Service in Britain does not outstrip its share of the gross national product, and that the capital investment in the health services in 1958 "was taking a much smaller share of the total national gross fixed capital formation" than in 1938.

Taking public services as a whole, capital investment in this sector has not kept up with the total national investment. In 1948-58 public services (including such as sewerage, laid drainage, etc.) absorbed only 29 percent of the gross fixed capital formation, whereas in 1938 they absorbed 42 percent. In contrast, current expenditures climbed steadily upward and increased somewhat faster than the gross national product.

The second major social service, in terms of both capital and current expenditures, is *education*. Noting "an increase in standards of educational provision since the war," PEP reports that facilities after the age of 15 are still quite inadequate in Great Britain. The study observes that these deficiencies are not fully recognized by the families interviewed and concludes that "an appetite for education is as slow to develop as the provision for educational facilities."

*Housing* is considerably less important in terms of public expenditures, since the main expenditure has been incurred as a capital cost, and there is no current public expenditure comparable to that involved in staffing and running the health or education services. Only a fraction of the families interviewed (25 percent) benefited from housing services and a significant proportion were still living in unsatisfactory conditions. Although very few complaints referred specifically to rents, housing was the only service about which there was considerable complaint. The PEP study concludes that "in view of shortages emphasized in this survey, public housing is undoubtedly still required and the only question is whether the relief to larger, poorer families should be applied to the rent by means of subsidies or should be applied to the family by means of family allowances or other financial assistance."

*National insurance*, in some form or another, reached 84 percent of all families in the PEP sample. Most families had drawn only one kind of benefit or none. Cash benefits, such as family allowances and maternity benefits, were received by 61 percent of all families, and 53 percent had drawn sickness benefits. The other benefits available—national assistance, unemployment benefit, retirement benefit, etc.—reached rather few of the families interviewed, partly because of the nature of the sample and partly because of full employment.

Given a chance to evaluate the assistance rendered by the social services, 31 percent of the families said that housing had not helped enough and 49 percent thought that more should be spent to improve this sector. Complaints about the inadequacies of other services were minor in comparison: 8 percent mentioned education service; 8 percent—family allowances; and 6 percent—insurance.

The PEP study concludes that the British programs have not eliminated all want and hardship. The social services program in Great Britain, says the report, "comprises a humanitarian idea rather than an administrative structure, and there is no automatic safeguard that the measures conceived up to the present deal with all possible causes of hardship. . . . It will do us no harm to remember that, however successful we may be at raising the general level of prosperity, problems of social policy towards the handicapped and the underprivileged are certain to remain."

(*Family Needs and the Social Services*, a survey by the Political and Economic Planning organization, George Allen & Unwin, London: 1961, xi and 233 pp., \$4.20.)

## Social Change in Latin America

IN CONSEQUENCE of the Act of Bogota and President Kennedy's *Alianza Para Progreso*, there is a new interest in the United States in supporting efforts to achieve social reforms in Latin America. Unfortunately, far too little is known in this country, both in official circles and among the public generally, about the social problems inherent in Latin American society and the obstacles which must be overcome if reforms are to be achieved. What little we know about Latin America is largely economic in nature, for the economists have written much in recent years on Latin America's trade and monetary problems, on the promotion of private U. S. investment in the area, and on other economic subjects.

A collection of background papers originally prepared for a Council on Foreign Relations discussion group, and recently published under the title *Social Change in Latin America Today*, Its Implications for United States Policy, will help significantly toward overcoming this lack of knowledge about Latin America's social problems in government agencies and among the interested public. Written by six social anthropologists, the book begins with a general chapter discussing the specific characteristics of Latin American society significant for U. S. policy, and then continues with chapters dealing separately with Peru, Bolivia, Brazil, Guatemala, and Mexico. The general chapter and those on Peru, Bolivia, and Guatemala contain imaginative analyses and fruitful insights into the nature of Latin American classes, attitudes, and values; the response of traditional social institutions and relationships to changes in expectations and economic activities; and the extent to which U. S. aid and other operations in the area are helping or hindering the achievement of desirable social reforms. Unfortunately, the chapters dealing with Brazil and Mexico are, in contrast, disappointingly pedestrian surveys of fairly obvious generalizations, facts and figures.

—Theodore Geiger

(*Social Change in Latin America Today*, Its Implications for United States Policy, by Richard N. Adams, John P. Gillin, Allan R. Holmberg, Oscar Lewis, Richard W. Patch, Charles Wagley and an Introduction by Lyman Bryson; Harper & Brothers, New York: 1960; xiv and 353 pp.; \$5.00.)

## The City in History

THE PUBLICATION of any book by Lewis Mumford is always a very special event. His books, published over the span of the past 40 years, have earned him a special position among the contemporary writers. Mumford's latest book, *The City in History*, displays all the qualities we have come to associate with his writing. It is a monumental achievement, marshalling an enormous array of facts, yet immensely readable and challenging. Told with a wealth of interesting detail, the story succeeds in holding the reader's attention from the first to the last page.

Mumford's basic humanistic conviction is unmistakable in every chapter. Still, without despairing of our capacity to do better, Mumford warns that in the light of history a survival of our established urban civilization is unlikely without a radical change in concepts and attitudes.

*The City in History* surveys both the physical and historical development of the cities, and the civilization of which the city is such a dominant part. Starting with a somewhat idealized picture of the contribution of the ancient village, Mumford traces the city's development from the Indus valley cities, earliest known to man, through Mesopotamia, Egypt, Crete to the cities of Greece and Rome, through the European medieval town to the metropolis of our own day. In a fascinating journey through time and space he guides the reader through each succeeding urban civilization in its heyday, and shows the causes for its decline.

Although different civilizations adopted different orders of values, the city's basic role—as a place of refuge and authority, a center for worship and trade, a source of culture as well as of domination of the surrounding countryside—has changed very little throughout history. The same has been true of the causes for the city's decline. Insecurity, immorality, social strife—the pattern has many variations but repeats itself time and again. Progress has been slow and gradual, and even altogether absent over long stretches of history.

Nevertheless, there are some noteworthy examples in the evolution of the city, such as the Greek city (Mumford's favorites here are Olympia and Delphi rather than Athens) which managed to limit its size through periodical migration and thus to avoid the worst evils that the lack of sanitation and health facilities held in store for the giants of antiquity: Alexandria and, especially, Rome.

A detailed description of Rome as the world's first "megalopolis" invites a parallel to the role of the metropolitan city of our own time. Mumford makes Roman history come alive. His observation that during the heyday of Roman domination cities were founded for the first time without the protection of an outer wall, tells us more about what almost 600 years of Roman rule meant for the progress of mankind than any enumeration of consuls, dictators, and emperors possibly could. The description of Rome's achievements in urban culture is followed by an analysis of the causes for her long and agonizing decline. Apart from outside pressures, it was social conflict that gnawed at the core of the Roman Em-

pire. The gap between the tiny layer of wealthy merchants and aristocrats and the gigantic urban proletariat could not be bridged. Systematically bribed with free bread distribution, lavish public facilities (such as the magnificent Roman baths) and gladiatorial spectacles, the citizens of Rome did less and less work until by 354 A.D. they enjoyed over 200 public holidays annually and the ordinary workday lasted only from daybreak to noon.

The total collapse of Rome threatened the very survival of even the most important European cities. Many centuries elapsed before they regained more than a fraction of their old importance. Mumford comes to the defense of the medieval European city which he regards as much maligned by later historians. He feels that most of the medieval city's shortcomings became acute only at a later age when it had outgrown its original limits.

Mumford has only contempt for the city developments originating with the industrial revolution. He shows that conditions during the late 18th and early 19th century were absolutely inhuman for most of an industrial city's inhabitants. He sees the emergence of the "suburban dream" as a reaction against the evils of the industrial city. He is in full sympathy with its early achievements and manifestations, but not with the later developments, responsible for the "urban sprawl" which will, he feels, ultimately result in deteriorating city centers and in new suburban slums. Instead, he would like to see the creation on a larger scale of organic communities such as the early English "garden cities" or the English "new towns" after World War II, planned not as commuting or dormitory suburbs, but as fully organic entities, providing places to live, to work, and to relax.

We have the knowledge and the technical means today to achieve a better life for more people than was possible at any time in the past. Viewing mankind's past record, however, Mumford says that the issue is in doubt. Yet he does not despair: "The final mission of the city is to further man's conscious participation in the cosmic and the historic process. . . . And it remains the chief reason for the city's continued existence."

—Peter Wagner

(*The City in History*, by Lewis Mumford; Harcourt, Brace & World, Inc., New York: 1961, xi and 657 pp., \$11.50.)

## New NPA Publication

***The Economic Impact of Federal Loan Insurance***, by George F. Break, University of California. Written under a research grant from the Merrill Foundation for Advancement of Financial Knowledge, the study analyzes the factors determining the impact of federal loan insurance and guaranties programs on output, employment, and prices. It develops quantitative measurements of this impact where measurable and, with their aid, appraises the cyclical performance of the programs. Notes, tables, charts, index, 274 pp., \$3.75.

Dr. Break's book is available to NPA members on a special discount basis as follows: Associate Members—25% discount; Library and Subscribing Members—30% discount; National Council, Company and Group Members, and Individual Members contributing \$25 or more a year—40% discount.

## Top Economists to Advise Treasury

Thirty of the nation's top economists have agreed to serve as consultants to the Treasury Department in their particular fields of study.

"The availability of these authorities on such a work basis insures orderly access by the Government to new ideas and findings in the fiscal, monetary, and general economic areas in which the Treasury operates—areas of basic importance to the economic welfare and growth of the nation," said Secretary Dillon, announcing the formation of the advisory group.

Senior Consultant, Dr. Seymour E. Harris of Harvard University, will coordinate the activities of the group.

Among the members of the advisory group: Dr. Gerhard Colm, NPA Chief Economist; Dr. Isador Lubin, Rutgers University, member of NPA International Committee; and four of the contributors to NPA's Tenth Anniversary Symposium, *The Employment Act—Past and Present*: Professors Roy Blough, Columbia University; Alvin H. Hansen, Wesleyan University; Albert G. Hart, Columbia University; and Paul A. Samuelson, Massachusetts Institute of Technology.

(Continued from page 4)

Children born at the beginning of the space age will be embarked on careers in less than 20 years. Their juvenile impressions on space and its implications will have powerful impacts upon their attitudes and career choices. For children the *now* and the *new* are more real since there is less background experience with which to perceive and interpret current events. Thus, young students will consider ordinary what to us is perhaps revolutionary. Children are the major carriers of change, both social and technological, because their eyes and ears and other senses are freed from the social restraints of adult experiences and beliefs so that they can bring fresh, unfettered minds to new events and ideas. Teachers and educational institutions which are training the future teachers of America, have a space age responsibility to be equipped properly to deal with young, uninhibited, inquiring minds.

The Office of Technical Information and Educational Programs of the National Aeronautics and Space Administration is making available materials to assist teachers in their space-related courses of instruction. Many members of NASA's staff are serving on educational committees and boards to help in curriculum developments designed for our age of science. Still others will take part in teacher workshops in aerospace education. NASA has established an educational services unit to assist educators to gain information which will help them and the general public to cope with their needs. Universities should be encouraged to support on-campus research; encourage participation of their key faculty members in government space activities; provide time for their qualified faculty to develop new classroom materials; and insure that teachers who are in the forefront of scientific and technological space programs have an opportunity to spend sufficient time with their students to truly educate and inspire.

## Publications Received

Bloomfield, Lincoln P., *The United Nations and U.S. Foreign Policy*, A New Look at the National Interest, Little, Brown and Co., Boston-Toronto: 1960, xi and 276 pp., \$4.75. An evaluation of the United Nations in terms of the United States' national interest in an attempt to measure the utility of a major diplomatic instrument in attaining specific national goals.

Canterbury, E. Ray, *The President's Council of Economic Advisers*, A Study of its Functions and its Influences on the Chief Executive's Decisions, Exposition Press, New York: 1961, 166 pp., \$4.00. An account of the history and functions of the CEA, and an evaluation of the significant role it played in shaping the U.S. economic policies.

Dustan, Jane and Makanowitzky, Barbara, *Training Managers Abroad*, Council for International Progress in Management (USA), Inc., New York: 1960, 2 volumes, 527 and LXI pp., \$12.50. Information on the methods used by American firms to train managers of their foreign branches and to prepare Americans for service abroad is included in this report on over 450 international managerial training and development programs of private and government organizations throughout the world.

Dustan, Jane, *Training American Businessmen for Work Abroad*, Council for International Progress in Management (USA), Inc., New York: 1960, 32 pp., \$2.50. A review of eight courses in the United States and one in Mexico City that provide businessmen with instruction in the culture or language of a foreign country.

Greniewski, Henryk, *Cybernetics without Mathematics*, Pergamon Press, New York and Panswowe Wydawnictwo Naukowe, Warsaw, Poland: 1960, 201 pp., \$6.00. The author presents the foundations of cybernetics as he outlined them at the First International Cybernetical Congress at Namur in 1956.

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